



The Regional Biomass Energy Program (RBEP) promotes increased production and use of bioenergy resources, and helps advance the use of renewable biomass feedstocks and technologies. Historically, the RBEP leverages two nonfederal dollars for every federal dollar it administers.

Benefits of Biodiesel Fuel

- **50% lower carbon monoxide and 95% lower hydrocarbon emissions**
- **30% lower particulate emissions (soot)**
- **50% lower ozone precursors**
- **75-90% lower polyaromatic emissions**
- **Completely eliminates sulfur oxides and sulfates**
- **Carbon dioxide recycling, which helps reduce greenhouse gas emissions**

"As stewards of the natural, unspoiled environment at Yellowstone National Park, we take pride in being at the forefront of implementing the use of clean, renewable fuels, such as the biodiesel used in the Truck in the Park project."

Jim Evanoff, Management Assistant
Yellowstone National Park



**U.S. Department
of Energy
Regional Biomass
Energy Program**

www.ott.doe.gov/rbep

ANOTHER RBEP SUCCESS: Bringing "green machines" to national parks, part 2: cleaner, quieter park fleets

CHALLENGE

Approximately three million people and 900,000 vehicles visit Yellowstone National Park each year, creating a growing environmental impact that endangers the park's clean air and water. Visitors have complained about the smoke and odor of the diesel-fueled buses and tour vehicles operating in Yellowstone, as well the National Park Service's own vehicles, which are often powered by diesel engines.

The Park Service is taking steps to correct the air quality and transportation problems created by the heavier tourism, such as investigating alternative propulsion technologies for the fleet of vehicles it operates in Yellowstone and other parks.

RBEP SOLUTION

Diesel engines are used extensively in vehicles operated within Yellowstone National Park. The "Truck in the Park" project was launched in 1995 with funding from the U.S. Department of Energy's Regional Biomass Energy Program (RBEP) to study the safety, performance, emissions, cold-weather capabilities, and overall benefits of using regionally produced biodiesel fuel in a diesel-powered vehicle within environmentally sensitive areas.

Biodiesel made from rapeseed oil is a regional product developed by the University of Idaho (UI) from resources in Montana and Idaho. When combusted, it has an odor similar to that of a french fry cooker. There was some concern that the exhaust from a diesel engine fueled by biodiesel could attract bears if the animals connected the scent to a food reward. The National Park Service and University of Idaho conducted a bear attractant study, which concluded that bears are not attracted to the scent of biodiesel.



Soybeans are one source of biodiesel.

Awards

2001 National Park Partnership
Environmental Conservation
Award (Honorable Mention) from
the National Park Service and
National Parks Foundation

1996 EPA Region VIII
Environmental Conservation and
Partnership Award

Partners

U.S. Department of Energy
Regional Biomass Energy Program

Montana Department of
Environmental Quality

U.S. Department of Interior
National Park Service



A U.S. Department of Agriculture chemist
compares the clear, soy-based product
with its petroleum-based counterpart.
(Photo courtesy of USDA – ARS)

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Additional information about
biodiesel and its uses can
be found at the National Biodiesel
Board website (www.biodiesel.org).

During the project, the National Park Service operated a 1995 Dodge three-quarter-ton pickup with a 5.9-liter Cummins diesel engine, supplied by Dodge Truck Division. The truck operated without modification on 100% biodiesel under normal operating conditions as a maintenance inspection vehicle within Yellowstone. The truck received normal maintenance service.

Periodic performance and emissions testing were conducted to determine if the biofuel caused any degradation in emissions or performance.



RESULTS

The project determined that biodiesel reduced undesirable emissions and that no new harmful compounds were generated. The project also developed data for use in modeling air quality so the impacts can be assessed before any large-scale conversion is implemented. Data showed that biodiesel or a blend may be the fuel of choice for restricted or poor air-dispersion conditions.

Operating the truck during five Yellowstone winters demonstrated that normal cold-weather diesel modifications are sufficient to permit using biodiesel in cold conditions. The truck achieved an initial overall fuel economy of about 16.3 mpg, or approximately one mile per gallon less than diesel fuel. In Phase II testing, the vehicle achieved 17.1 mpg.

BENEFITS

Biodiesel has become an established alternative fuel for more than 100 fleets nationwide, including school districts, government agencies, and public utilities. Today, commercial-scale processors can produce and sell biodiesel for one to two dollars per gallon.

The benefits of operating on biodiesel include reduced toxicity, decreased emissions, less smoke, fewer unpleasant odors, and increased safety and biodegradability.

For every unit of energy needed to produce biodiesel, 3.24 units of energy are gained. This is the highest energy balance of any fuel. (Source: National Biodiesel Board)

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